

July 15, 2021

Exhibit 7

Montana Water Center

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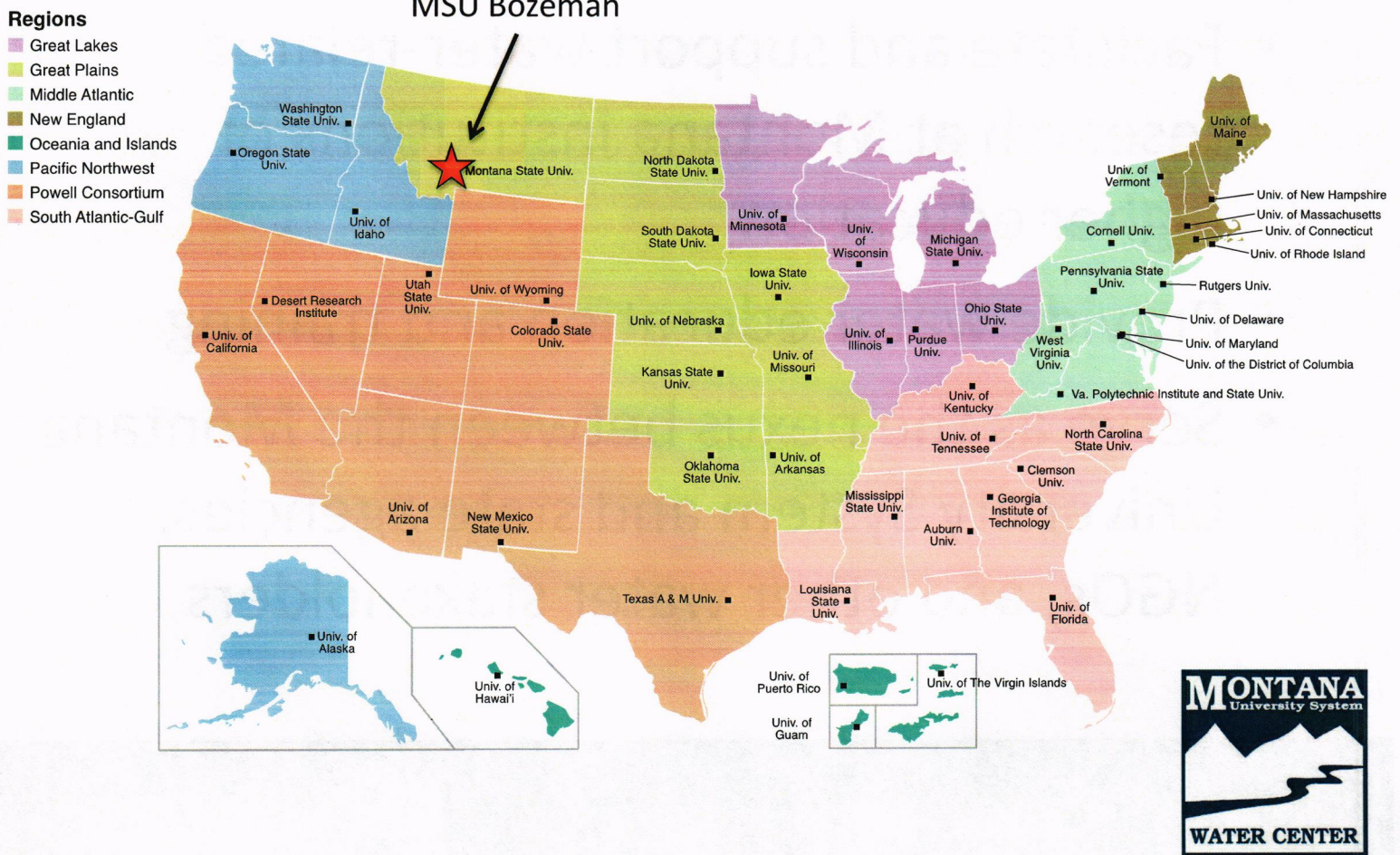
The 'Water Resources Research Act' (1964)

initiated the university-based Water Centers



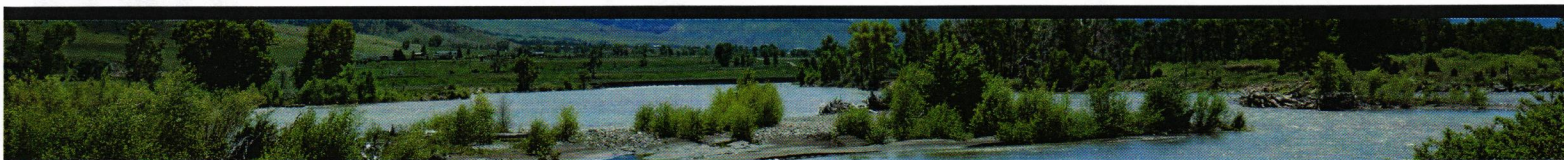
- An adequate supply of clean water is essential for economic stability and growth, agriculture, and human well-being
- Initiate a national network of water centers to help solve state-level water resource issues

Water Resource Research Institutes



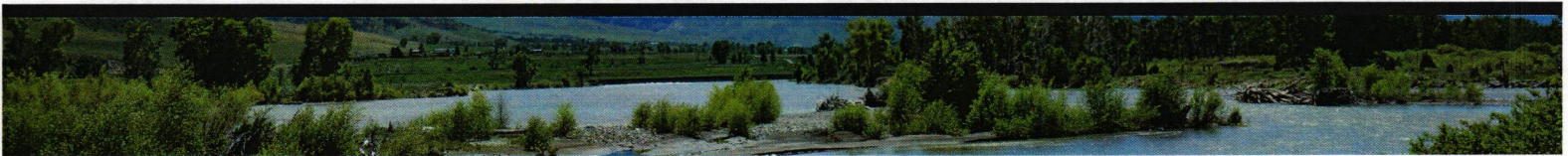
Core Mission

- Facilitate and support water-related research at Montana institutions of higher education
- Provide water education and training
- Serve as the nexus between the Montana University System and state agencies, NGOs, and other water stakeholders



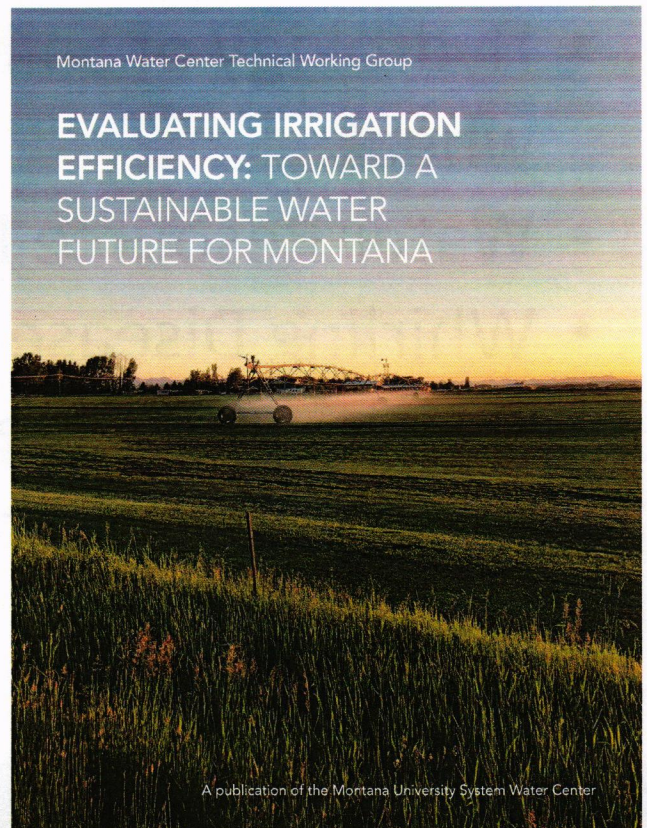
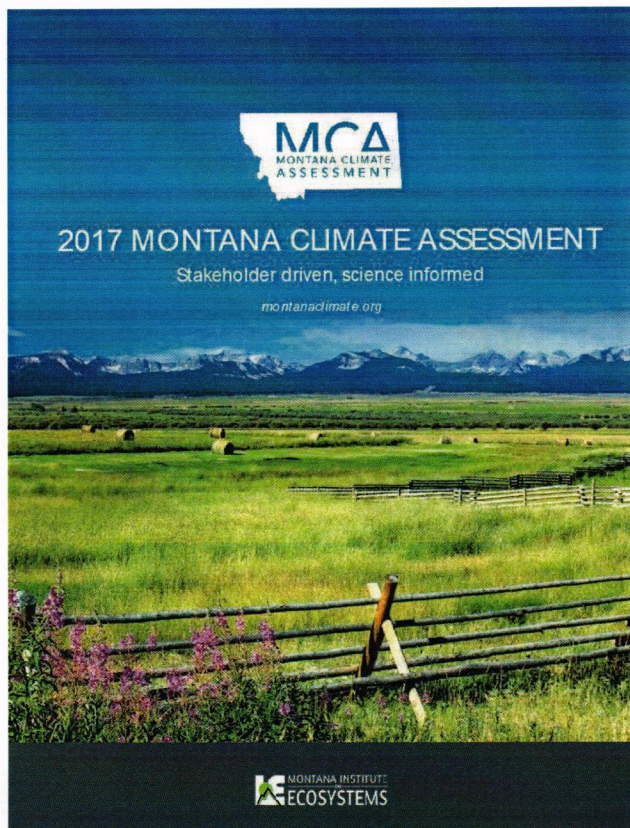
Example initiatives to support Montana

- Hydrology of Saline Seeps – dryland wheat
- Water Resource Management Simulator
- Whirling Disease Initiative
- Training resources for rural water and wastewater operators

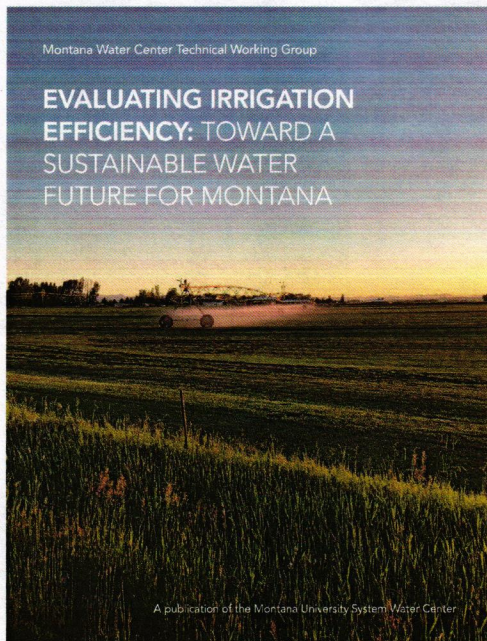


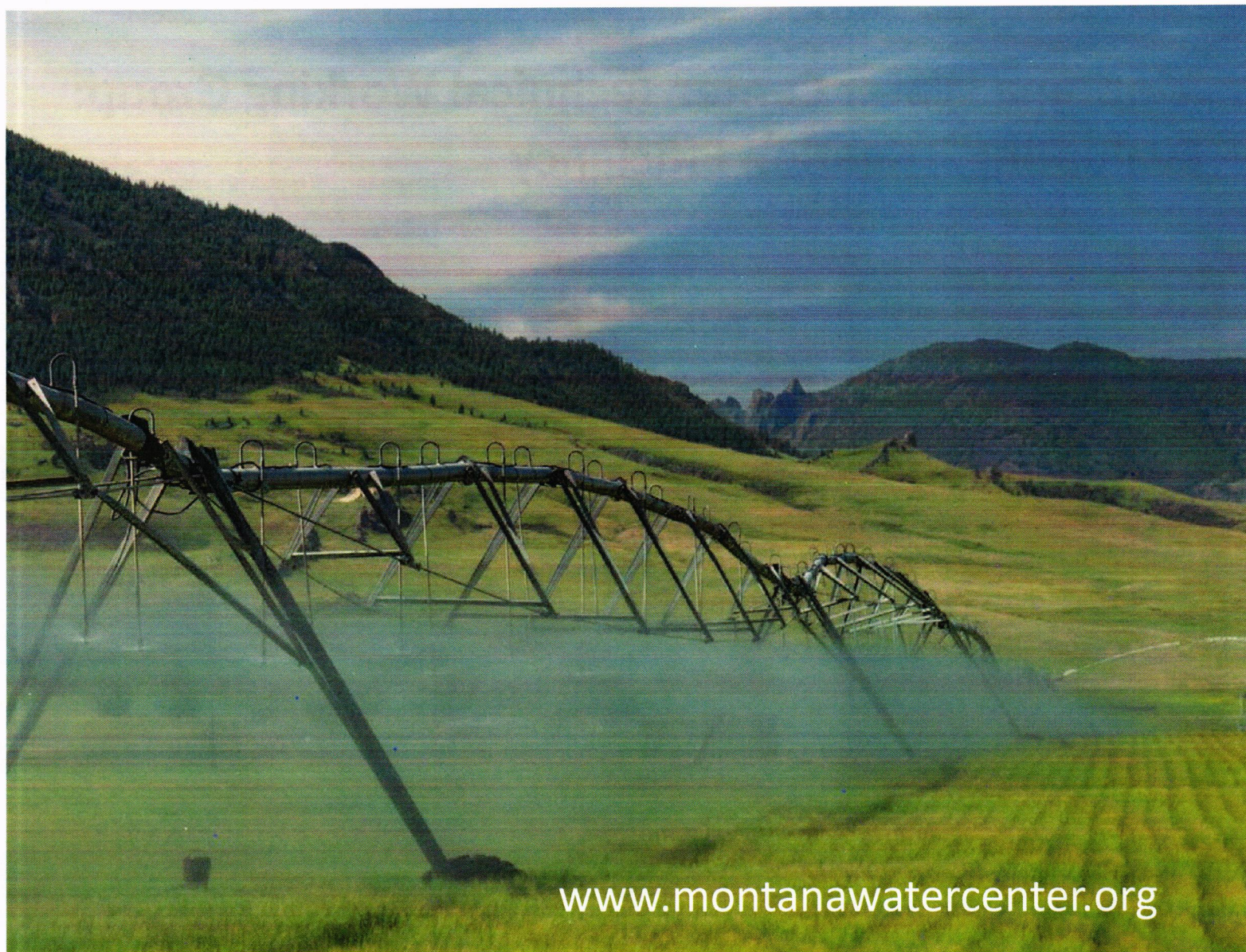
Recent years

Technical Working Groups, Syntheses



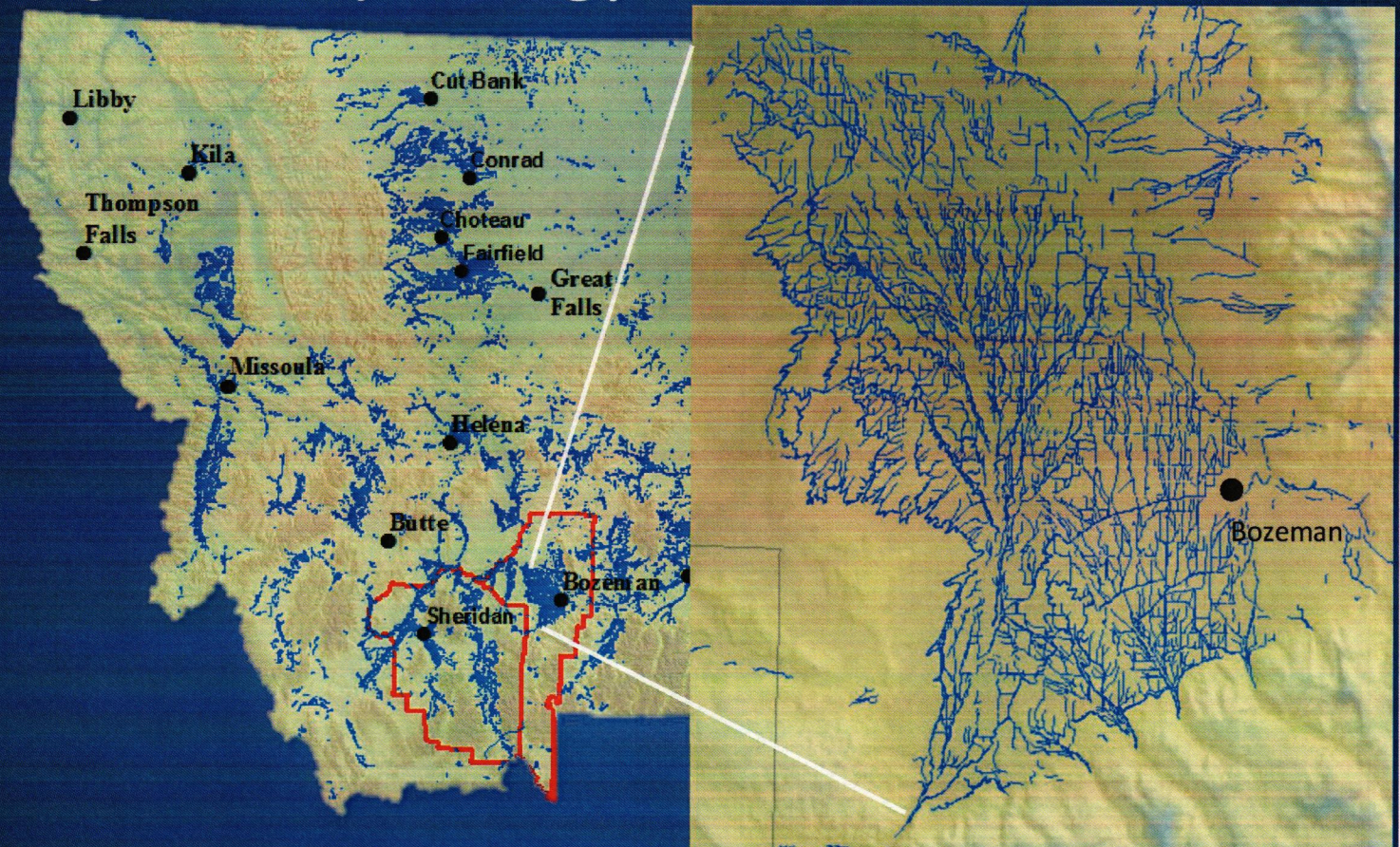
Montana Water Center Technical Working Group: Evaluating Irrigation Efficiency





www.montanawatercenter.org

Irrigation hydrology



Extensive Canal Network

Slide from Ginette Abdo

~20% of irrigated land in Montana has been converted from flood to sprinkler

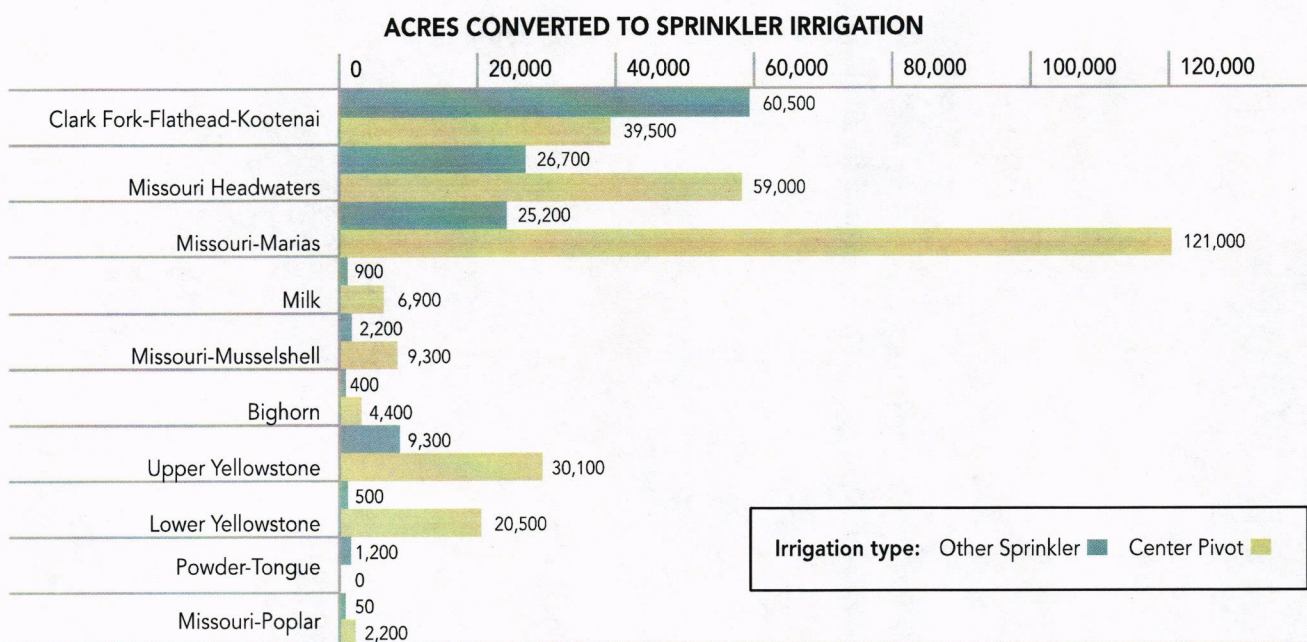


Figure 3 | Conversion to sprinkler irrigation in Montana by major watershed. A comparison of the Department of Natural Resources and Conservation Water Resource Survey (DNRC-WRS) mapping and the Department of Revenue Final Land Unit (DORFLU) classification in 2019 provides an estimate of the amount and geographic location of conversion from flood to sprinkler irrigation in Montana.⁵⁴ This comparison is limited to the land area included in the mid-20th century DNRC-WRS. The analysis therefore captures proportional changes in irrigation method across Montana but may underestimate actual acreage converted to sprinkler.

Flood irrigation  Sprinkler irrigation

Modernization of irrigation infrastructure



- Increased time and labor efficiency
- Increased crop production
- Reduced diversions

Modernization of irrigation infrastructure



- Can change timing and availability of water
- Reduces groundwater recharge
- Water conservation?

Take-away Messages

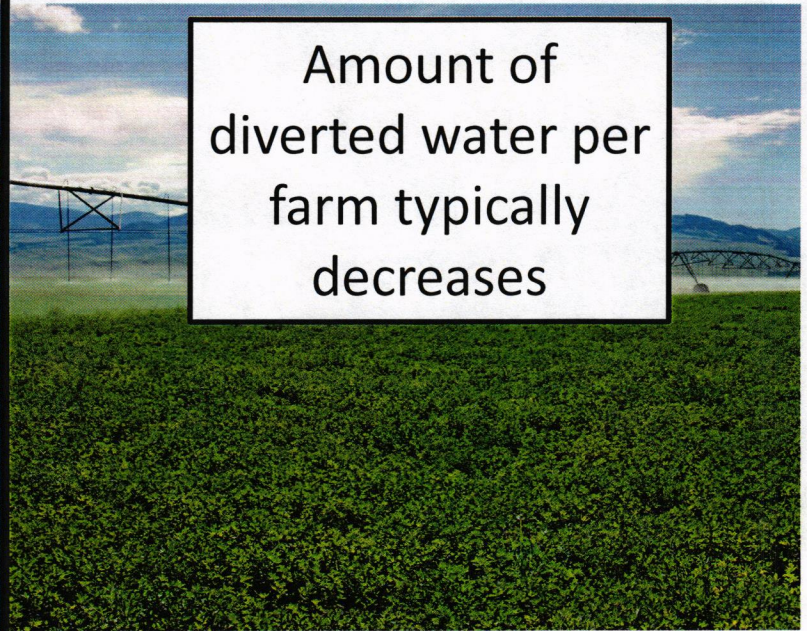


- **No one-size-fits-all best method or plan**
- **Outcomes of changing efficiency are site-specific**
- **We need better data to inform our decisions**

Flood irrigation  Sprinkler irrigation
Unlined conveyance  Lined conveyance

Reduced application of water
Less water seeps beneath the soil profile

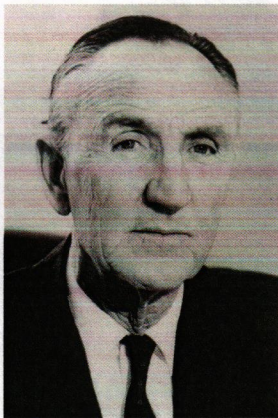
Amount of
diverted water per
farm typically
decreases



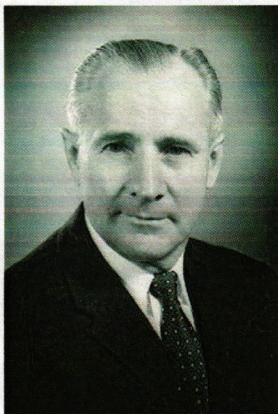
Less water seepage
Reduced diversions



Montanans were instrumental in the founding of the water institutes

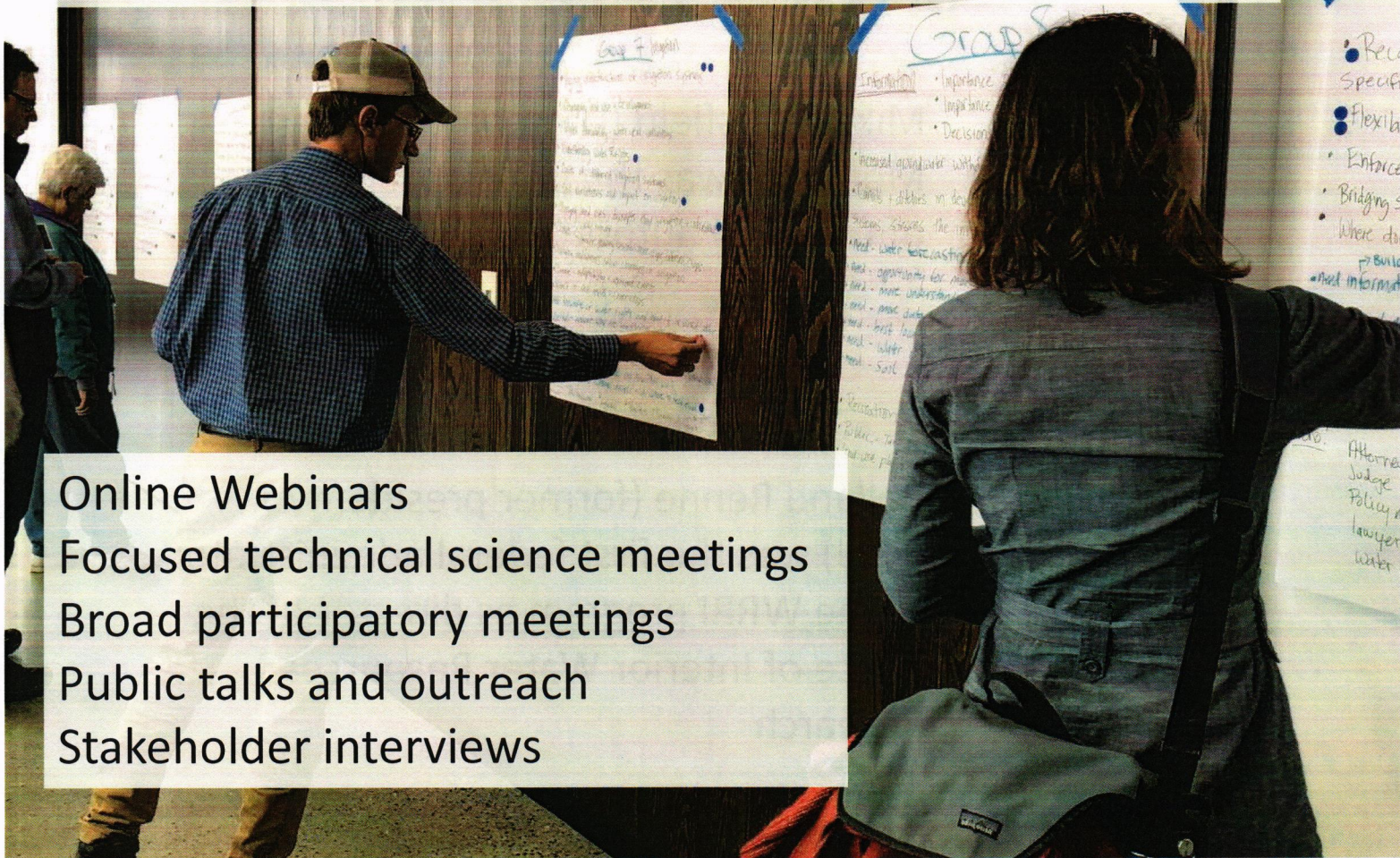


Mike Mansfield (US senator from Montana) was the principal sponsor of the 1964 authorizing legislation



Rolland Renne (former president of MSU) was the first federal administrator of the WRRRI program as director of the Office of Interior Water Resources Research

University faculty and students, state and federal agency scientists, water planners, legal experts, NGOs, producers, legislators, irrigation managers, tribal agencies, consulting firms



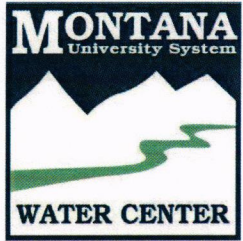
Online Webinars

Focused technical science meetings

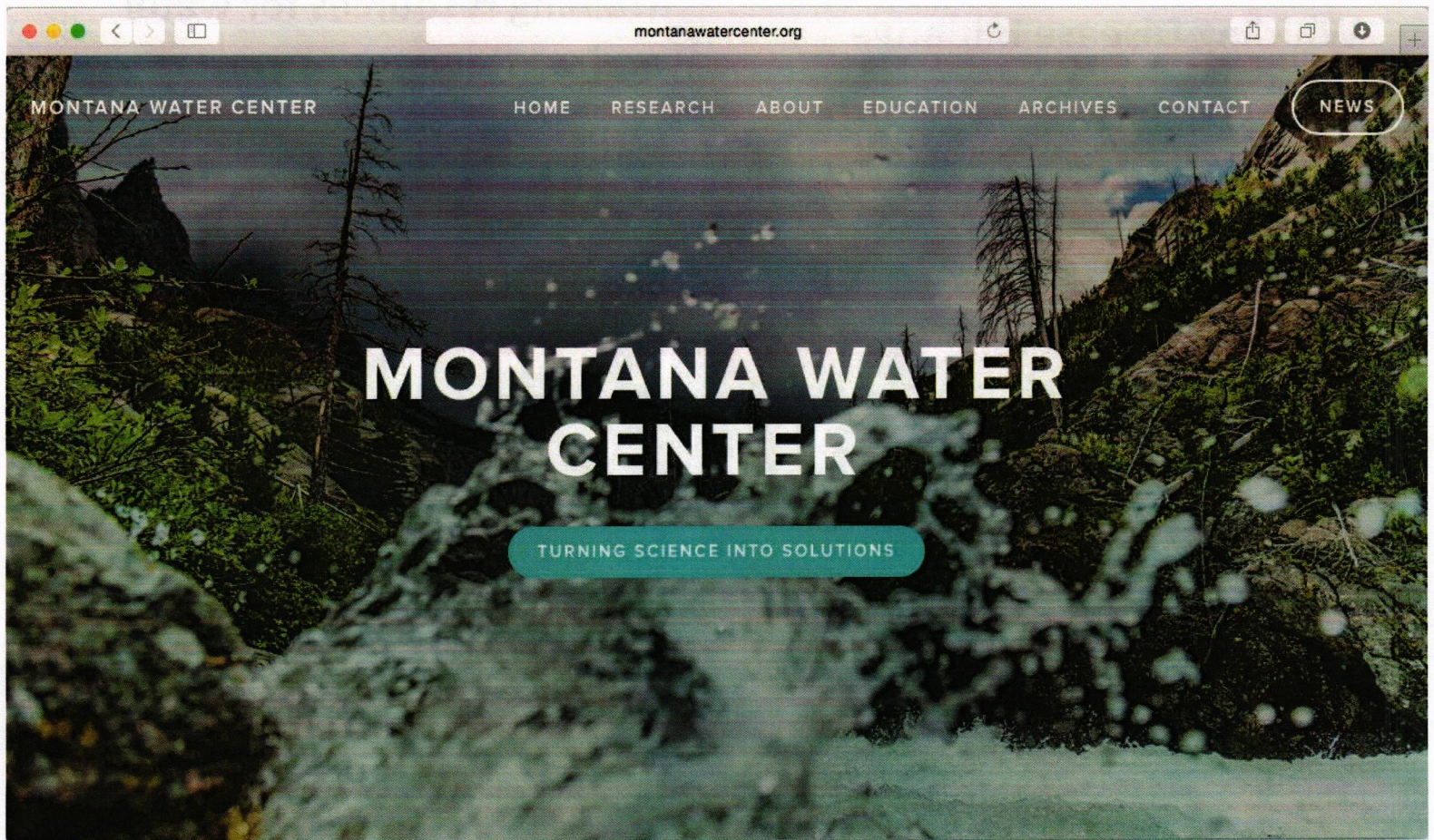
Broad participatory meetings

Public talks and outreach

Stakeholder interviews



www.montanawatercenter.org



1990's – 00's

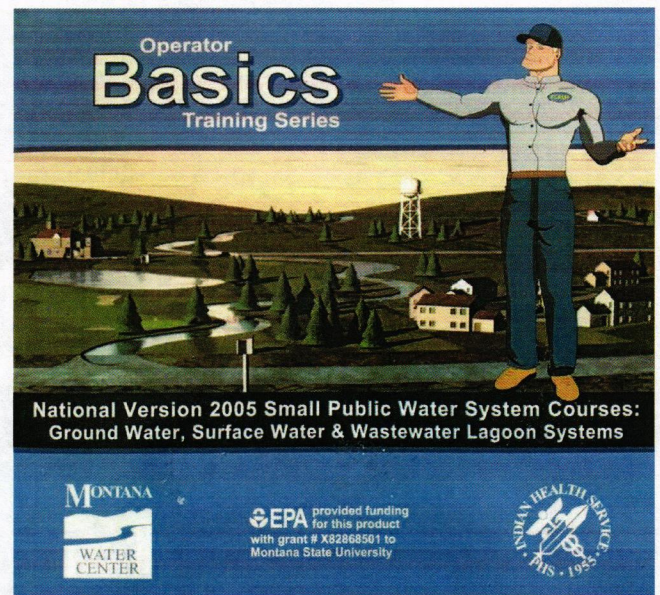
Whirling Disease Initiative

A Cause for Concern: Whirling Disease in Montana

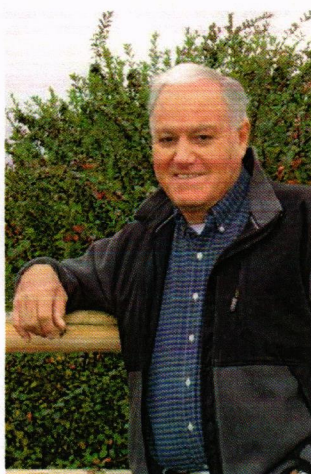
posted in history and case studies, home



Training resources for water and wastewater operators



The MT Water Center has had 10 directors since 1964



Duncan Patten

(2012-2014)



Gretchen Rupp

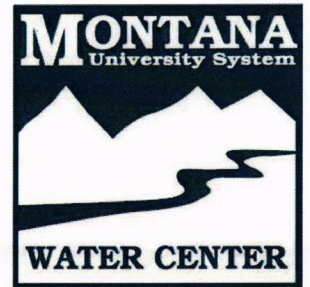
(2000-2012)

Dorothy Bradley

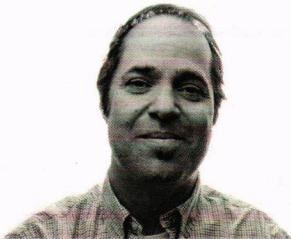


(1992-2000)

MT Water Center



Wyatt Cross



Director 0.3 FTE

Nikki Sandve



Education Director 1.0 FTE

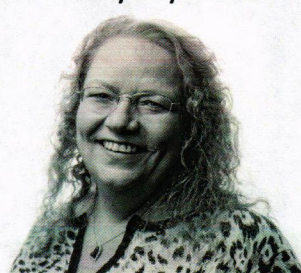


Stephanie McGinnis



Assistant Director 0.5 FTE

Nancy Hystad



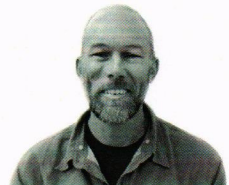
Administrative Associate 0.7 FTE

John Lafave



Associate Director

Andrew Wilcox



Associate Director

Annual Budget = \$93,000 from USGS (base grant)
\$50,000 from Montana State University
\$78,000 from DNRC for Watercourse

Research

Annual Funding Opportunities

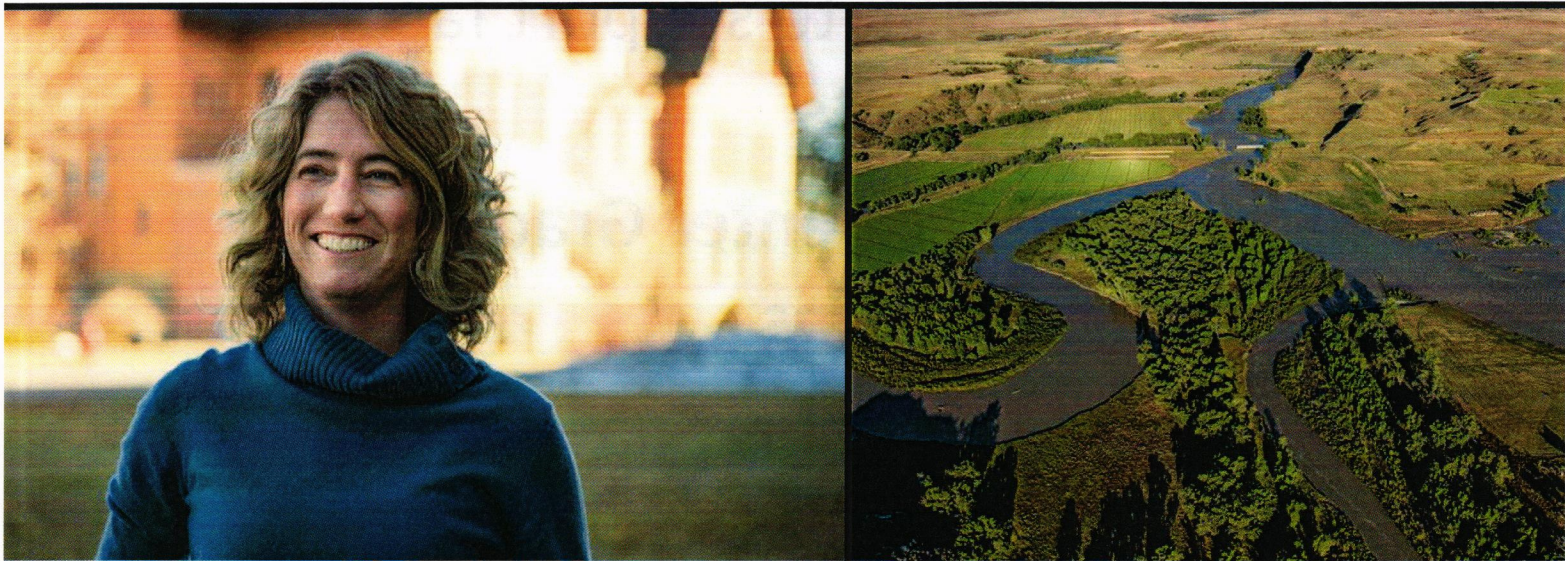
- **Montana Water Center Faculty Seed Grants**
 - Typically ~\$45K to support faculty research projects
- **Montana Water Center Graduate Student Fellowships**
 - ~\$5K to support graduate students

Dr. Jamie McEvoy
Earth Sciences, Montana State University

Quantifying 'natural infrastructure' (i.e., floodplains, wetlands) potential on the Musselshell River

What are the social and political barriers/opportunities to enhancing natural storage?

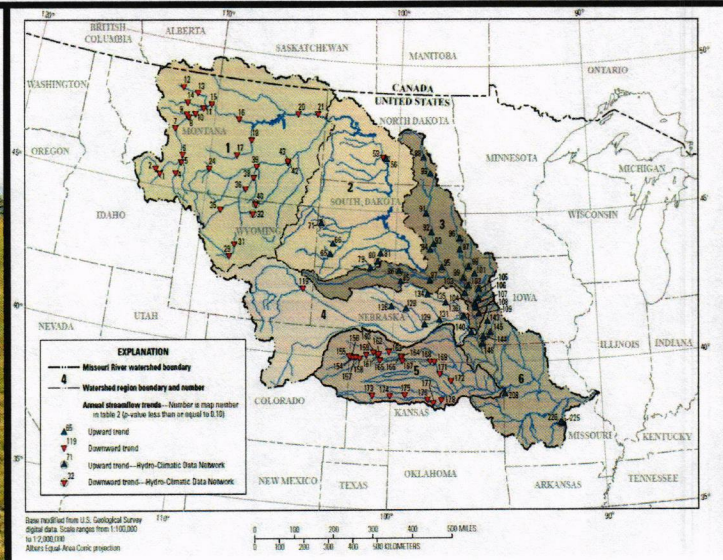
Partners: DNRC, DEQ



Dr. Ben Poulter
Ecology, Montana State University

How will future land use and water management influence water supply in the Upper Missouri River Basin?

Partners: USGS, Wildlife Conservation Society



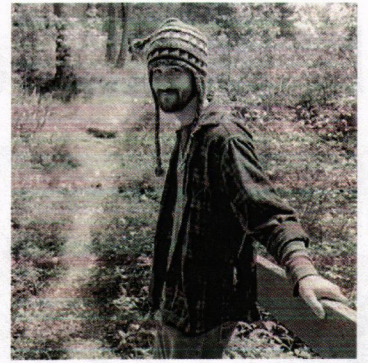
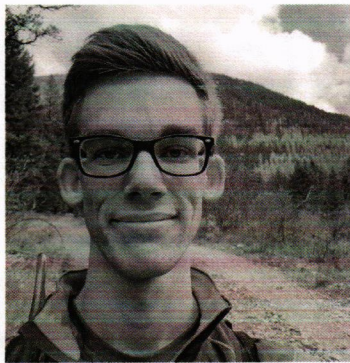
Dr. Ellen Lauchnor

Civil Engineering, Montana State University

Improving wastewater treatment facilities –
understanding why household products reduce the
ability of microbes to remove nitrogen pollution



2015 Graduate Student Grantees



MIRANDA MARGETTS (MSU): [Enhancing tribal environmental health literacy](#)

MICHAEL JAHNKE (U of M): [Effects of wildfire on water resources](#)

SARAH BENJARAM (MSU): [Sedimentation in MT rivers](#)

TAYLOR WILCOX (U of M): [Conserving native trout](#)

Research

Montana AWRA Meeting

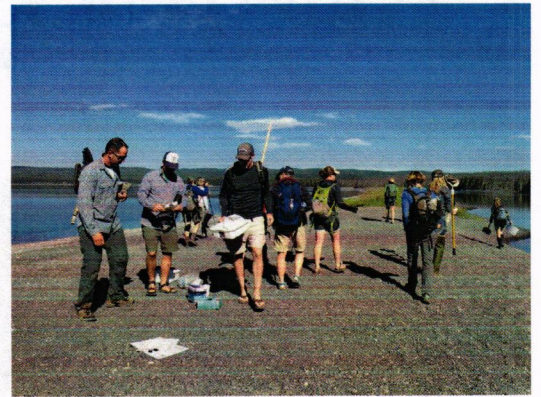


American Water Resources Association



Education and Outreach

**K-12
University
Teachers
Practitioners**





- Provided education to ***over 1400 adults and youth*** during 2014 and 2015
- In-person workshops, online training, graduate classes, and field teaching opportunities

Graduate Classes for Educators

- Lake Ecology
- Developing Effective Watershed Projects
- Watershed Hydrology



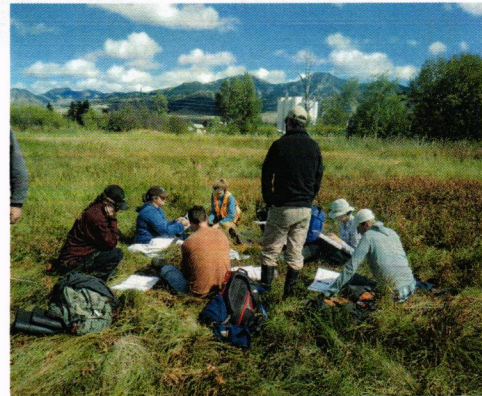
Professional Development for Teachers

- Project WET – water curriculum aligned to state standards
- Developing local water projects for student participation



Professionals and Community Members

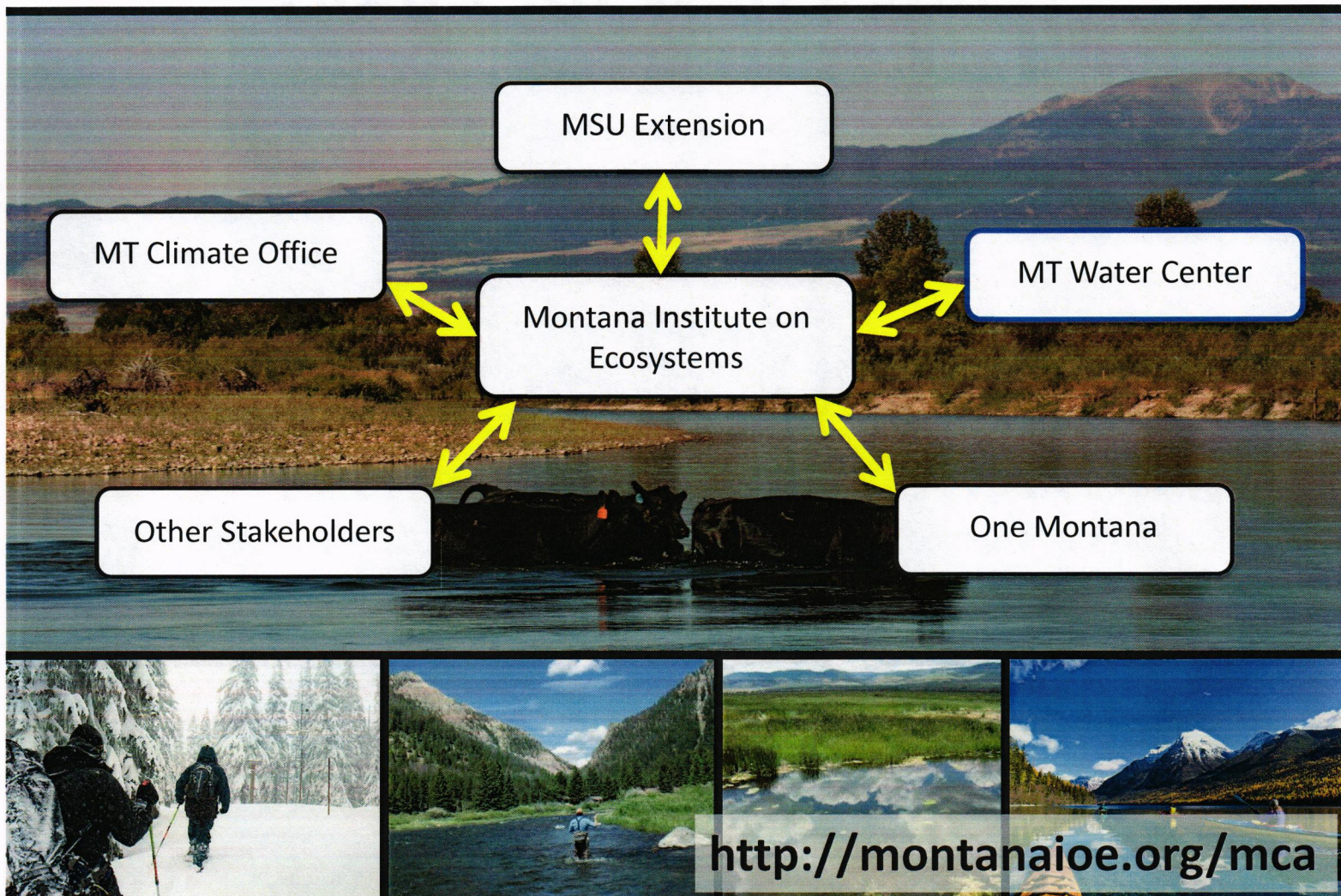
- Water Rights Workshops for Realtors
- Stream-Floodplain Restoration Workshops
- Dam Safety Workshops
- 2014 Statewide Stormwater Conference
- Montana Water Supply Initiative Outreach
- Online Education Resources for Watershed Professionals



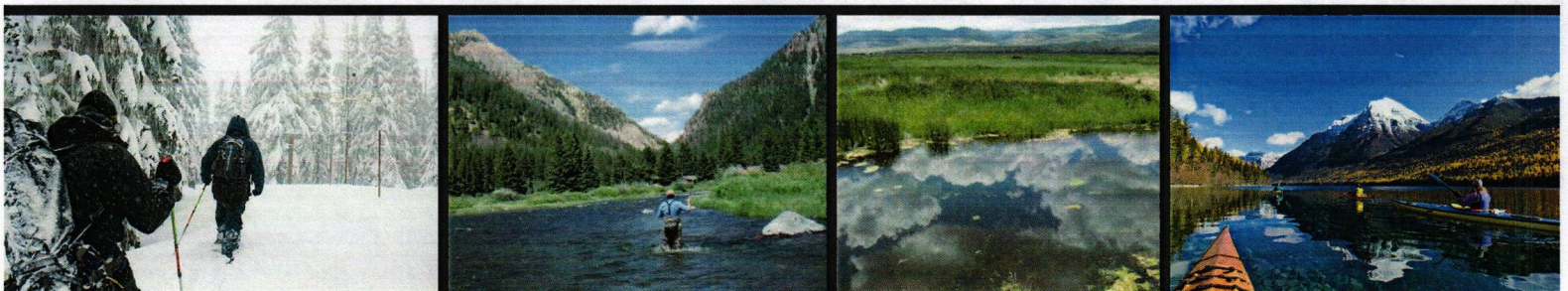
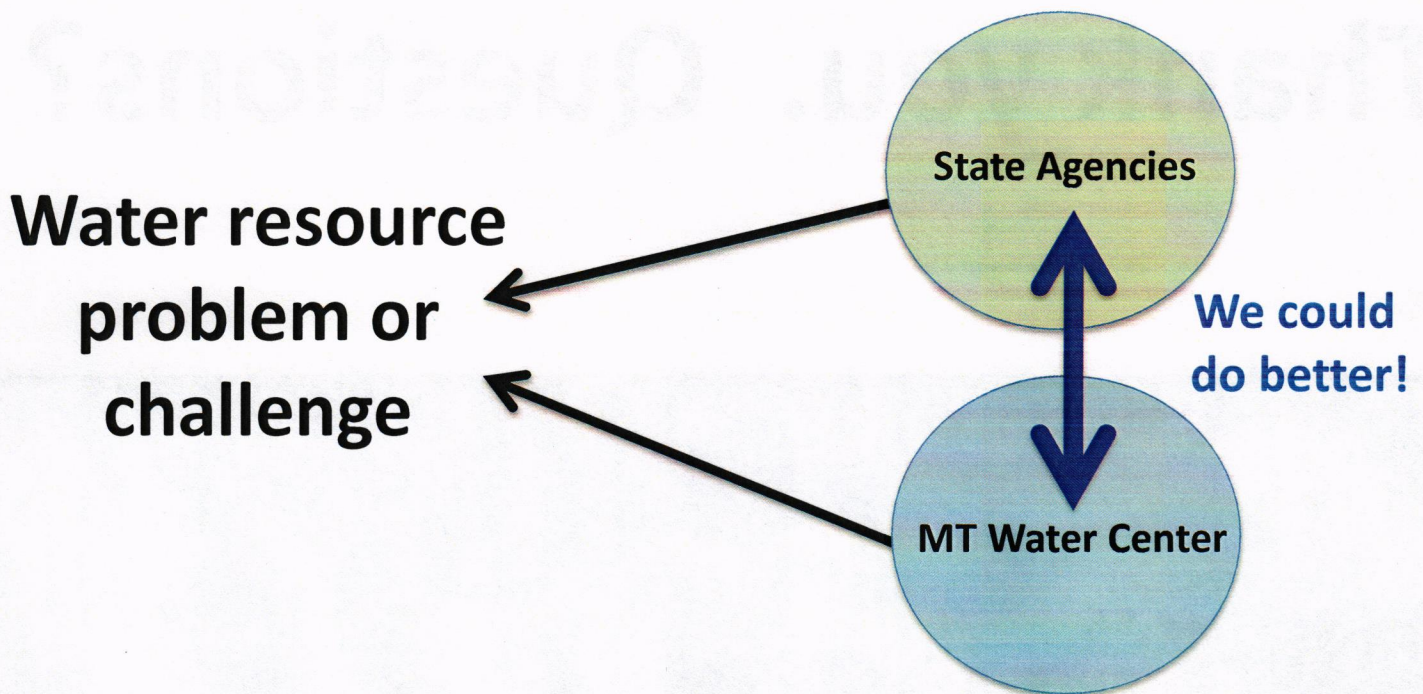
What's new for 2016?



MT Climate Assessment



A call for collaboration/coordination



Thank you. Questions?

